

ABSTRACT

Purpose. Comparison of porosity and permeability of two dental investment materials set under external air pressure and to verify its clinical relevance by evaluating the surface of cast metal for nodules.

Materials and methods. A total of 10 stainless steel dies simulating maxillary molar crown preparation were used to make wax moulds, 60 in number. They were distributed into 6 equal groups and investment material was poured: groups I,II,III- Bellavest SH investment material set at atmospheric pressure, 35psi, 70 psi respectively; groups IV, V, VI- Bellasun investment material set at atmospheric pressure, 35psi, 70 psi respectively. The surface of set investments was analyzed for number of voids. Cast copings were made over these investment cores and the fitting surface evaluated for cast nodules.

Results. The number of voids in Groups I,II,III,IV,V,VI was 25.07 ± 5.23 ; 9.3 ± 2.54 ; 7.6 ± 2.37 ; 26.20 ± 4.66 ; 6.3 ± 2.11 ; 5.7 ± 1.70 respectively. The differences were statistically significant ($p=0.0001$). The number of cast nodules in copings of Groups I,II,III,IV,V,VI was 23.80 ± 5.75 ; 5.0 ± 3.12 ; 3.8 ± 1.55 ; 25.40 ± 4.20 ; 6.10 ± 2.47 ; 4.8 ± 2.49 respectively. The difference was statistically significant ($p=0.0001$). The time taken for air to pass through for Groups I,II,III,IV,V,VI was $36.40 \pm 5.13s$; $99.80 \pm 16.53s$; $200.40 \pm 13.81s$; $31.20 \pm 5.26s$; $57.40 \pm 5.68s$; $72.60 \pm 6.23s$ respectively. The differences were found to be statistically significant ($p=0.002$).

Conclusion. In this study, application of external pressure reduced the number of voids in investment and cast nodules. The permeability of investment was inversely proportional to the pressure applied. The use of 35psi was advantageous considering both these variables.

Keywords. Porosity, Permeability, Number of Voids, Cast Nodules, Air Pressure investing